

ORD-2227-65

11 August 1965

MEMORANDUM FOR: Director of Research and Development

SUBJECT: ORD Intelligence Sciences Laboratory
Facilities for Analysis Division Program

1. We attach a summary of the principal elements of the proposed Analysis Division/ORD program which we have discussed in the last few weeks. We urge the adoption of the general plan of this program and the consideration of increased funding for FY66.

2. A new and important aspect of our program is concerned with the implementation of the analysis portion of an ORD Intelligence Sciences Laboratory to be set up in Headquarters Building. The tasks to be carried out by means of this facility, funding and manpower requirements, and additional background information are summarized in the attached material.

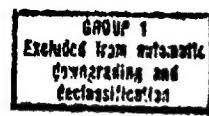
3. We suggest that the Analysis Division program, which has been in process of formulation for the past year, is a pertinent and important element to be included in a possible Agency response to questions raised by the recent PFLAB memorandum and studies of the NPIC operations.



Chief, Analysis
ORD/DD/S&T

Attachment:
An/ORD Summary Program

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Analysis Division/ORD

General Summary of Program Objectives

I. OPERATIONS AND SYSTEMS RESEARCH

Program Objectives:

- To describe and update an integrated model of the overall intelligence process for purposes of management control and R&D planning.
- To determine by a continuing study, the impact on the intelligence process of new advances in technology; e.g., mass memories, time-shared computers, multiple terminals, new recording, input, and display methods, new automated recognition methods, etc.
- To design new intelligence processes and systems by the application of predictive analysis methods, statistical decision theory, mathematical modeling and operations analysis techniques.

II. RESEARCH AND DEVELOPMENT ON MAN-MACHINE PROCESSES

Program Objectives:

- To design, develop and show feasibility of processes and equipment for support of human intelligence processing, interpretation, and production from textual, speech, graphic and waveform input data by application of available time-shared computer technology involving specialized remote terminals and displays.

III. RESEARCH AND DEVELOPMENT ON LANGUAGE AND TEXT PROCESSES

Program Objectives:

- To design, develop, and show feasibility of processes and equipment for improved collection, interpretation, and

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production operations concerned with textual and language data. The R&D program shall include work on the following:

Textual Input and Transcription Processes
Representation and Indexing Processes
File Organization - Search - and Retrieval Processes
Automated Formatting, Summation, and Reporting
Logical Analysis and Automated Inference
Automated Classification
Machine-Aided Translation
Machine Translation

IV. RESEARCH AND DEVELOPMENT ON SPEECH PROCESSES

Program Objectives:

- To design, develop, and show feasibility of processes and equipment for optimization of intelligibility of speech records, and for implementation of an audio pre-processing system with capabilities for automated phoneme, word and speaker recognition.
- To design, develop, and show feasibility for operational use of a speech recognizer and phonetic typewriter for the continuous input of speech into data-processing systems.

V. RESEARCH AND DEVELOPMENT ON PATTERN RECOGNITION

Program Objectives:

- To design, develop, and show feasibility for operational use of pattern recognition processes and equipment for intelligence interpretation and production operations.

The R&D program shall include work on:

Facial Recognition Processes
Handwriting Recognition Processes
Analyst Character and Line-Reading Pencil
Pattern Recognition Processes for Graphic Data
(Photo, [redacted])
Recognition and Signature Determination Processes
for Waveform Data
Universal-font Character Recognizer

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VI. RESEARCH AND DEVELOPMENT ON AUTOMATA, SELF-ORGANIZING AND ADAPTIVE PROCESSES

Program Objectives:

To design, develop, and show operational feasibility of processes and equipment which can sense, operate on and use intelligence data in remote and unaccessible locations and which function as automata, self-organizing processors, or processors which adapt to environment or to incoming sensory data.

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Intelligence Sciences Laboratory - Analysis Program

SPECIFIC TASK AREAS

Laboratory facilities under this program are required for the development, testing, and evaluation of man-machine procedures, equipment, and subsystems in the following areas:

I. Documentary Analysis - Intelligence Production:

Processes which exploit the potential of on-line keyboards, displays, text analyzers, text recognizers, formatting, and editing routines, are to be developed and integrated to provide machine aids for the intelligence analyst.

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II. Photo Interpretation:

Processes using computer-controlled graphic scanners at various levels of resolution, keyboards, input tablets with scribe input and control, mensuration equipment, visual, video, and CRT displays are to be developed further and integrated into on-line operational subsystems for interpretation of photo,

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III. Speech Processing:

Processes using converters, dynamic filtering, CRT displays, spectrum displays, voice control, audio output, pattern recognition processes, pitch tracking analysis, are to be developed and integrated into on-line operational subsystems for enhancing the intelligibility of speech in audio records, for optimizing speech signals in noisy records, for automated recognition methods for words, phonemes and speakers.

IV. Indexing, Search and Retrieval:

Processes using on-line keyboards, CRT displays, automated dictionary files, automated syntactic analyzers and parsers,

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recent developments in logical representation, file organization, and search strategy are to be developed and integrated into an on-line indexing, search and retrieval subsystem for documentary intelligence data.

V. Text Processing:

Processes using keyboards, CRT displays, input tablets, and printers are to be developed and integrated into on-line subsystems for editing, formatting, correcting, composing, and report generating from textual input data.

VI. Signal Processing and Correlation:

Processes using converters, signal correlators, comparators, keyboards, CRT displays, transient and delay analyzers, sensor inputs, computer-controlled cameras, recorders, signal and pattern recognizers are to be further developed and integrated into an on-line subsystem for reduction, analysis, and interpretation of waveform and multisensor data.

VII. Pattern Recognition:

Processes using data input devices, keyboards, input tablets, computer-controlled scanners, converters, correlators, visual, video and CRT displays, pre-normalization, property classification and discriminant analysis methods, are to be further developed and integrated into subsystems for automated and human-monitored subsystems for recognition and interpretation of patterns of interest in graphic and waveform intelligence data.

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Intelligence Sciences Laboratory - Analysis Program

Program Emphasis:

Emphasis is on exploitation of newly available computer technology with remote terminals, program-controlled devices and time-shared processors for intelligence analysis and interpretation.

Emphasis is on design and further development of basic man-machine functions in order to provide essential design and planning data for full systems implementation. Basic functions will be integrated into operational subsystems, tested, and demonstrated in order to show feasibility for application in Agency operations.

Why Action on this Program is Urgently Recommended Now:

1. New developments in man-machine technology can provide better tools to deal with the difficult problem of increased intelligence collection and limited man-power resources.
2. Major changes will be made in intelligence operations because of the impact of man-machine technology. Steps should be taken to lead in this period to the greatest extent possible.
3. There is danger that large systems applications will be attempted before the basic processes required in these systems have been sufficiently developed. This can be extremely costly and may actually impede desired progress.
4. There should be an adequate base of technical know-how and experience within the Agency in order to provide guidance for management and planning in a very complex and costly change-over period.

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5. The intelligence community has specialized requirements which are not being taken care of by developments for the military and for business applications. The Agency should take a lead in initiating appropriate R&D for its specialized needs and it should maintain a position in this area.
6. Recently certain scientific advisory groups, including the Communications Panel for the PFIAB, have urged that more positive action be taken in the man-machine area in the intelligence community. Studies of the NPIC operation urge action in the same direction. The program proposed for the Analysis Division/ORD has been formulated over the past year. The program demonstrates that the Agency has been resourceful and active in this important area; however, expansion and implementation of the program should now be carried forward.

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**ORD/DD/S&T
Intelligence Sciences Laboratory
Analysis Program**

Facilities:

The following types of computer on-line devices and terminals are to be developed, improved, or evaluated in the analysis program:

- typewriters, keyboards, control consoles
- CRT displays with light pen input and control
- computer-controlled cameras, recorders, and video displays
- computer voice-controlled units and audio outputs
- computer-controlled graphic scanners
- input tablets with scribe input and control
- printers, plotters
- acoustic dynamic filtering equipment
- signal correlators, signal comparators
- spectrum display equipment
- A-D and D-A converters
- signal recognizers and transient analyzers
- various sensors and transducers
- pattern recognition and signature determination equipment
- character recognition equipment
- manual character reader unit
- dynamic and static wall display equipment for graphic and alphanumeric data

Central processor facilities will be provided with capacity to drive terminals and devices under development and with sufficient memory to permit testing and evaluation of experimental pre-operational systems.

Relation to OCS Facilities:

It will be a policy in the planning and implementation of this facility to establish linkages with the OCS facilities where this is feasible and desirable. Available OCS services are to be used particularly for input keying and processing of data and for programming tasks of common interest.

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**ORD/DD/S&T
Intelligence Sciences Laboratory
Analysis Program**

Action Schedule FY66

25X1 August 1965 Install Teleprinter terminal in An/ORD, Headquarters Building, in order to carry out querying, searching, retrieval, analysis and programming experiments with remote time-shared centers (e.g., [redacted]
etc.). [redacted] 25X1
[redacted] 25X1

25X1 September 1965 Install terminal in An/ORD to link with [redacted]
[redacted] systems for evaluation and experimentation concerned with the search and retrieval of highly structured and formatted intelligence data. 25X1

25X1 October 1965 Initiate projects with [redacted] concerned with development of on-line processes for text processing, search and retrieval. Install console linked with time-shared system at [redacted] New York. 25X1
[redacted] 25X1

25X1 November 1965 Complete study of specifications for processor and essential terminals and computer-controlled devices for analysis program for the ORD Intelligence Sciences Laboratory.

25X1 Spring 1966 Install processor and on-line terminal equipment in ORD, Intelligence Sciences Laboratory at Headquarters Building.

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